

FINAL  
R&D CONTRACT STATUS REPORT  
(15 June 1983 through 30 August 1990)

on

CORE OPERATIONS OF THE METALS AND CERAMICS  
INFORMATION CENTER  
(A DoD Information Analysis Center)



to

Office of the Under Secretary of Defense  
Research and Engineering

Contract Number DLA900-83-C-1744

Statement "A" per telecon Jerome Persh.  
Office of the Deputy Under Secretary of  
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## INTRODUCTION

This is the Final Report for the core operations of the Metals and Ceramics Information Center (MCIC) operated by Battelle under Contract No. DLA900-83-C-1744. This effort was initiated on 15 June 1983; except for the continued sale of publications and the completion of 10 special tasks, all core activities were discontinued as of 15 August 1990.

MCIC was the outgrowth of information center activities started at Battelle in 1955 as the Titanium Metallurgy Laboratory (TML). Three years later, TML was expanded to include other metals used in critical Department of Defense (DoD) applications and renamed Defense Metals Information Center (DMIC).

Based on the DMIC example, in the early 1960's, the Ceramics and Graphite Technical Evaluation Center was established at Wright-Patterson Air Force Base. After being chartered as a DoD Information Analysis Center (IAC) this program was contracted to Battelle in 1967 for operation as the Defense Ceramic Information Center (DCIC).

In 1971, DMIC and DCIC were merged to form the MCIC. The new scope now covered both metals and ceramics of interest to DoD and its related industrial and academic communities.

In 1979, Battelle was awarded the contract for the operation of the Mechanical Properties Data Center (MPDC). Because of the overlap of scopes, MCIC absorbed MPDC in 1982. Except for the numeric database (which was discontinued) all other MPDC activities were now covered under the MCIC scope. The major publications of MPDC, the Aerospace Structural Metals Handbook and the Structural Alloys Handbook, were continued.

With a bibliographic database that has grown to 67,406 computerized records and a manual file of over 70,000 (prior to 1971), MCIC has become a valuable source of information for DoD agencies and their contractor community.

The technical management of the Center has been assigned to the Office of the Under Secretary of Defense, Research and Advanced Technology; Mr. Jerome Persh was the Contracting Officer's Technical Representative. The contract administration has been performed by the Defense Logistics Agency through the Defense Electronics Supply Center; Mrs. Sarah Williams was the Contracting Officer.

## GOALS AND OBJECTIVES

The objective of MCIC's operations was to increase the productivity of scientists, engineers, and technicians engaged in scientific and engineering programs for the Department of Defense.

MCIC was a major source for technical and bibliographic information for DoD agencies, DoD subcontractors, and related U.S. industry. Also, MCIC served a larger technical community through the availability of its products and services.

### ACTIVITY SUMMARY

Activities during this reporting period are summarized as follows:

-- Acquisition and Input of Source Information.

Quarter	Documents		Content, Percent		Foreign, Percent
	Acquired and Reviewed	Added to DROLS	Metals and Metallurgy	Ceramics and CMC	
First	767	705	72	28	59.5
Second	761	705	72	28	57.5
Third	743	705	72	28	57.5
Fourth	<u>331</u>	<u>315</u>	<u>75</u>	<u>25</u>	<u>30.5</u>
Total, FY-1990*	2,602	2,430	72.5	27.5	54 (Weighted Avg.)

\* through August 15, 1990

The MCIC database also continued to serve as a resource for other users (through DROLS on-line services). An average of 162 sites per month retrieved 32,934 records in FY-1990.

- Inquiry Services. For the final reporting period, 32 inquiries were handled -- 24 technical and 8 bibliographic. Total income during this period was \$468. For the entire contract, \$47,385 income was realized from the MCIC inquiry services.
- Handbooks and State-of-the-Art Reports (SOARs). The sale and maintenance of the *Aerospace Structural Metals Handbook* (ASMH) and the *Structural Alloys Handbook* (SAH) were continued. Fifty-eight new ASMH's and 37 SAH's were sold this year; 637 and 107 update subscriptions were sold for the ASMH and SAH, respectively.
- Current Awareness and Promotion. Publication of the *Current Awareness Bulletin* (CAB) on a monthly basis has continued. The last of the two issues prepared in this quarter was distributed to 4,240 recipients. Marketing and promotion resulted in the sale of 1,118 items in this fiscal year.
- Financial Status. The following is a summary of the financial status of the program:

	<u>Fourth Quarter</u>	<u>FY-1990</u>	<u>Cumulative</u>
Cost Incurred (Fee Included)	\$351,337	\$2,344,750	\$15,602,907
Core Funding	0	447,000	4,585,964
Sales of Products and Services	79,906	749,870	11,348,633

- Special Tasks and Studies. During the course of this contract period (15 June 1983 through 30 August 1990), 64 Special Tasks have been undertaken. Of these, 55 have been completed; 9 are on-going. Total Special Task funding is \$9,638,633, of which \$9,394,742 are MIPR'd funds and \$243,851 are Special Task income. The special tasks will be completed by 31 January 1991.

ACQUISITION AND INPUT OF SOURCE INFORMATION  
(Helen Pestel, Manager)

The information base maintained by MCIC provided technical documentation needed by staff scientists and engineers to compile the various products of the Center and provided a rapid, inexpensive retrieval mechanism to support the Center's technical inquiry service and special studies. Over 67,000 records of documents in the information base were directly available for searching by users of DROLS. The total database contained over 140,000 documents collected and reviewed since 1955 under MCIC and its predecessors.

The objective of this task was to acquire and input the technical data and information necessary for the support of the various products and services of the Center. The activities conducted to attain this objective included:

- Identifying, screening, and acquiring reports, articles, and other literature and/or data within the scope of this Center.
- Accessing, abstracting, and indexing of all pertinent material for computer storage.
- Maintaining the MCIC bibliographic database on DROLS.

### Acquisition of Information

As part of the identification effort, MCIC monitored new contract awards in the Commerce Business Daily (CBD). A questionnaire concerning the program scope was sent to both the Contractor and the Sponsor identified in the CBD. This questionnaire also requested that MCIC be placed on the distribution list for any reports generated on the specific contract. Information about MCIC and the Current Awareness Bulletin (CAB) was offered. Approximately 25 percent of the contractors contacted responded to this questionnaire.

Identification and acquisition of pertinent technical literature was aggressively pursued by the MCIC staff. The primary sources of reports generated by DoD and other Government agencies were the contractors or agencies that produced the reports. Receiving reports on direct distribution avoided time delays in receipt of this information from secondary sources and allowed the Center access to interim progress reports not distributed to secondary sources.

Unfortunately, more recently Government Agencies were not adding Information Analysis Centers to report distribution lists as readily as in previous years.

Pertinent reports not received on direct distribution were identified and ordered from Government abstracting services including DTIC's *Current Awareness Bulletin*, NTIS's *Government Report Abstracts and Index (GRAI)*, NASA's *Scientific and Technical Aerospace Reports (STAR)*, and DOE's *Energy Research Abstracts (ERA)*.

Journal articles and technical papers were selected by daily screening of material entering the Battelle Library. This source was supplemented by subscribing to key journals and ordering of individual technical papers. Metals Abstracts was searched for foreign technology coverage to supplement the Library holdings.

During FY-1990, the sixth fiscal year (10.5 months of effort) of the current MCIC contract, 2,602 documents were acquired and reviewed for input into the MCIC database (331 during the first half of the fourth quarter). Of these, 172 documents (16 in the fourth quarter) were rejected because they were not considered relevant to the MCIC scope or because they duplicated information presently in the information base.

The acquisition and input of source information was at a slightly lower rate in FY-1990 than FY-1989 due to the expiration of the contract on 15 August 1990.

The type and number of documents accessioned by MCIC for the database in FY-1990 are shown in Table 1. Included are journal articles, government reports, conference papers, and miscellaneous sources such as books, trade literature, and internal papers.



TABLE 1. MCIC ACQUISITIONS FY-1990

Document Type	Quarterly Period					Annual Total (10.5 months)	Percent Fourth Quarter	Percent Annual
	October - December 89	January - March 90	April - June 90	July - August 15, 90				
Journal Articles	338	503	441	218		1,500	69.2	61.7
Technical Reports	206	155	207	53		621	16.8	25.6
Air Force	41	41	67	13	162			
Army	29	18	34	10	91			
Navy	26	18	36	18	98			
Other DoD	19	11	12	5	47			
NASA	12	16	7	3	38			
DoE	24	31	25	2	82			
Other Non-DoD	55	20	26	2	103			
Technical Papers	154	44	54	43		295	13.7	12.1
Miscellaneous	7	3	3	1		14	0.3	0.6
Total	705	705	705	315		2,430	100.0	100.0

Documents related to metals and metallurgy represent 72.5 percent (75 percent in the fourth quarter) of the FY-1990 input, and ceramics (including ceramic matrix composites) represent 27.5 percent (25 percent in the fourth quarter) of the input.

### Foreign Technology

About 55 percent of the documents entering the MCIC file were authored by foreign organizations. During the fourth quarter the percentage of input related to foreign technology was 30 percent.

Beginning with the May, 1985 CAB, the foreign-authored documents entering the MCIC database for the quarter were categorized by area of the world and by subject area.

The 43 countries\* authoring MCIC database input for FY-1990 and the number of articles contributed per quarter were as follows:

Country	Qtr. 1	Qtr. 2	Qtr. 3	Qtr. 4		Annual Total		
				Number	Percent	Number	Percent	Rank
Australia	4	3	10	2	0.6	19	0.78	15
Austria	4	4	7	2	0.6	17	0.70	17
Belgium	8	2	3	0	0	13	0.53	20
Brazil	2	0	2	0	0	4	0.16	25 (tie)
Canada	18	13	13	5	1.6	49	2.02	8
China	19	14	12	1	0.3	46	1.89	9
Czechoslovakia	0	1	4	0	0	5	0.21	24 (tie)
Denmark	5	1	0	0	0	6	0.25	23
Finland	10	5	3	0	0	18	0.74	16
France	40	39	26	8	2.6	113	4.65	6
Germany (West)	57	22	43	9	2.9	131	5.39	4
India	16	15	17	8	2.6	56	2.30	7
Ireland	0	1	1	2	0.6	4	0.16	25 (tie)
Israel	6	8	6	1	0.3	21	0.86	14
Italy	9	5	8	2	0.6	24	0.99	13
Japan	69	129	91	12	3.8	301	12.39	2
Korea	1	7	6	0	0	14	0.58	19
Netherlands	14	7	6	4	1.3	31	1.28	11
Norway	2	4	4	1	0.3	11	0.45	21 (tie)
Poland	2	6	3	0	0	11	0.45	21 (tie)
Saudi Arabia	2	1	1	0	0	4	0.16	25 (tie)
South Africa	4	4	2	2	0.6	10	0.41	22 (tie)
Spain	4	2	3	1	0.3	10	0.41	22 (tie)
Sweden	7	15	10	1	0.3	33	1.36	10
Switzerland	10	1	4	1	0.3	16	0.66	18
Taiwan	7	2	18	2	0.6	29	1.19	12
Turkey	1	0	3	1	0.3	5	0.21	24 (tie)
United Arab Republic	1	3	0	1	0.3	5	0.21	24 (tie)
United Kingdom	57	44	55	20	6.4	176	7.24	3
USA	285	300	300	219	69.6	1,104	45.43	1
USSR	35	37	42	8	2.6	122	5.03	5
Yugoslavia	1	3	0	0	0	4	0.16	25 (tie)
11 Countries (3 or less per year)	5	7	4	2	0.6	18	0.74	
Totals	705	705	705	315	100.0	2,430	100.00	

\* The Country of origin was determined by the affiliation of the first author when the experimentation was completed.

### DROLS Input

A total of 2,015 of the 2,430 documents accessioned this contract year were processed into the MCIC dedicated database at DTIC (DROLS), 253 of the 315 in the fourth quarter; the remaining 415 documents (62 in the fourth quarter) were already in the DTIC collection. The DTIC records for these references were supplemented with the MCIC accession number and enriched indexing.

The number of records in the MCIC database on DROLS is approximated as of the loading of Cycle 90-20, which was loaded after the close of the MCIC contract on 15 August 1990. The total file size should be 67,406 records with 48,443 of these unique to the MCIC program and 18,963 MCIC-modified DTIC holdings. This number could not be verified because MCIC lost access to DROLS on 15 August 1990.

### On-Line Usage of the MCIC Database

The MCIC database was open to all DROLS users since 1980. Surprisingly few problems regarding the use of the database were brought to the attention of the MCIC staff from 1980 to the present. During the past year the MCIC input staff had instructed several new DROLS users in the procedures for accessing the Information Analysis Center files. The MCIC database staff has been represented at the Annual DROLS User's meeting and the regional user meeting to assist users of the MCIC and other IAC databases.

Table 2 summarizes the use of the MCIC database by type of organization for unique MCIC records displayed or ordered from the DROLS sites for FY-1990. The number of users retrieving records from the MCIC database in FY-1990 was slightly less than in FY-1989. For the first ten months of FY-1990, 32,934 records from the MCIC database were used by an average of 162 DROLS users per month (other than MCIC). Only July's statistics on DROLS use for the fourth quarter were available for incorporation in this final report.

### Concerns and Problems - Information Operations

The backlog of documents in process was eliminated before the termination of this contract. At that time, many records were in the MCIC temporary storage file on DROLS awaiting up-dating of the Technical Reports Database. Because our user access to DROLS ended, corrections to these records after DROLS up-dating could not be made. About 50 records needing corrections will be transferred to the follow-on contractor for implementation.

The backlog of documents awaiting acceptance as input for the database has grown steadily during the contract due to funding limitations. The backlog in the form of documents and references to pertinent documents will be transferred to the new contractor.

TABLE 2. MCIC DATABASE USAGE VIA DROLS FOR TEN MONTHS OF FY-1990.

Class of Users	First Quarter			Second Quarter			June 1-30			Third Quarter			July 1-31			FY-90 Totals (10 months)		
	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved
Air Force	14.3	701	15.00	934	17.0	171	16.00	592	18.0	175	15.4	2,402						
Army	23.3	804	26.67	1,275	23.0	162	28.00	1,480	23.0	215	25.7	3,774						
Navy	15.3	421	16.00	1,062	16.0	120	14.67	386	14.0	121	15.2	1,990						
Other Government	13.7	671	14.00	799	17.0	119	16.00	507	16.0	272	14.7	2,249						∞
Industrial	74.3	3,735	79.00	4,647	74.0	847	68.00	3,060	65.0	733	72.9	12,175						
Academic	3.7	42	3.67	62	3.0	30	3.67	105	2.0	12	3.5	221						
DTIC	8.00	1,366	8.00	2,092	9.0	882	8.67	2,096	8.0	613	8.2	6,167						
Other IACs	7.7	852	7.33	2,458	2.0	120	5.67	554	2.0	92	6.4	3,956						
Total Others	160.3	8,592	169.67	13,329	161.0	2,451	160.67	8,780	148.0	2,233	162.0	32,934						
MCIC	1	1,854	1.0	2,123	1.0	870	1.00	2,036	1.0	292	1.0	6,305						
Total	161	10,446	171	15,452	162	3,321	162	10,816	149	2,525	163	39,239						

\* As measured by the records displayed by users with both on-line displays and orders, data available through July, 1990.

During this contract two improvements to the database were initiated or continued. Prior to 1986, only about 10-15 percent of the unique MCIC records in DROLS were date searchable and sortable. At the present time all MCIC records from 1979 to the present are date searchable and sortable. It is estimated that prior to 1979 about 10,000 of the 48,443 unique records are yet to be dated in field 11 to become searchable and sortable by date. Also during this contract the correction of ambiguous and miskeyed index terms in the MCIC vocabulary was continued from the previous contract. Even though this activity was at an extremely low rate of effort to conserve project funds, the vocabulary was reduced by 30 percent during the contract. This effort was to be aided by DROLS during FY-90 with the programming change to permit global editing. This global editing feature, requested by the IACs since the early 1980s, was not available as of 15 August 1990.

Table 3 summarizes the acquisition and input of source information, and use of the MCIC database on DROLS for the contract period 15 June 1983 to 15 August 1990.

#### TECHNICAL AND BIBLIOGRAPHIC INQUIRY SERVICES (John B. Hallowell, Manager)

An inquiry service (designed primarily for use by the Department of Defense, its agencies and subcontractors) was provided by MCIC for many years. In accordance with the requirements of an Information Analysis Center (IAC), a rapid-response service was possible through the availability of a select group of skilled scientists and specialists at Battelle. By placing the inquirer in direct contact with an appropriate technical authority, answers were provided to the degree of depth required. Answers were executed through the use of telephone discussions, on-line computer printouts, letter reports, onsite visits, and MCIC-published reports and handouts. Battelle technical specialists provided a unique capability to respond directly to inquiries or provide assistance to formulate search strategies for the retrieval of pertinent technical documents.

Starting in October 1984, the Inquiry Services records were computerized. The documentation, easily accessed, was utilized to generate the various tables (appendices) for the Quarterly reports.

During the last reporting period (July 1 through 15 August 90), 32 inquiries were processed; eight were bibliographic and 24 were technical. Appendix A is a Summary of the inquiries and responses for this shortened period. Five inquiries were not completed due to the end of the MCIC Contracts. Two inquiries were paid; the no-charge inquiries are listed in Appendix B. One foreign inquiry (No. 5099) was completed.

For this reporting period, the 32 inquiries can be categorized as follows:

TABLE 3. SUMMARY OF ACQUISITION, INPUT AND USE OF SOURCE INFORMATION FOR THE CONTRACT

	FY-1983 6/15- 9/30/83	FY-1984	FY-1985	FY-1986	FY-1987	FY-1988	FY-1989	FY-1990 10/1/89- 8/15/90
Documents Received	1003	3026	3031	2566	2343	2664	3022	2602
Documents Accessioned	907	2855	2856	2472	2161	2445	2820	2430
Metals, Percent	92.9	91.6	89.1*	89.3*	87.8	89.5	84	72.5
Ceramics, Percent	7.1	8.4	10.9	10.7	12.2	10.5	16	27.5
Foreign, Percent	N/A	59.1	63.4	62	49	58	61	54
Average Monthly Users MCIC Database	148	146	154	157	170	168	164	162
Number of Records Used	10,686	41,942	49,631	44,600	47,165	44,048	41,083	32,934
Database Size Unique Records	32,546	35,239	38,104	40,176	41,927	44,002	46,343	48,963
Shared Records	15,408	16,033	16,783	17,169	17,561	17,875	18,334	18,963

\* Includes 8.8 and 27.4 percent corrosion information processed under the Corrosion Information Analysis Task in FY-1985 and FY-1986, respectively.

Industrial	23
DoD	6
NASA	1
Academic	1
Foreign	1

Thirteen (41 percent) were for DoD-related programs. One of the paid inquiries was charged directly to a Battelle account; the other was invoiced. The total charged for this period was \$305; actual income for the same period was \$468.

Battelle personnel directly involved in responses for this period are listed, by specialty, in Appendix C.

For the entire contract period, 15 May 83 to 15 Aug 90, 2,302 inquiries (747 bibliographic and 1,555 technical) were processed. For the period 1 Oct 84 through the end of the contract, 1,818 inquiries (601 bibliographic and 1,216 technical) were entered into the database providing accurate statistics for this period.

1,394 individuals from 1,004 organizations requested assistance in those 1,818 inquiries. 826 inquiries (45.5 percent) were related to DoD programs. Further statistics for both technical and bibliographic inquiry services are present in Table 4.

#### TECHNICAL PUBLICATIONS (John B. Hallowell, Manager)

One important activity of this program was information and technology transfer on advances in materials that were within MCIC's scope and related to applications in defense systems and hardware. In response to needs of Government, particularly DoD, as well as industrial and academic communities, a variety of publications were prepared by the Center. The archival documents included handbooks/databooks, technical reports (state-of-the-art reports, proceedings of conferences, and critical reviews or technology assessments), and comprehensive listings of available literature as related to identifiable areas of interest. These products were sold throughout the course of the contract. A listing of the reports and handbooks being sold at the end of the core operation is given in the brochure included on the inside, back cover of this report.

At the conclusion of the contract, MCIC was contractually responsible for only the maintenance and publication of the following handbooks:

- *Aerospace Structural Metals Handbook (ASMH)*. Five volume set with quarterly updated.

TABLE 4. TECHNICAL AND BIBLIOGRAPHIC INQUIRY STATISTICS

	4thQ83 <sup>(1)</sup>	FY84	FY85	FY86	FY87	FY88	FY89	FY90 <sup>(2)</sup>	Contract Total
Total Inquires	147	338	381	281	308	308	301	238	2,302
By User									
DoD	3	25	19	20	22	27	36	27	182
Other Gov't	13	11	15	6	8	6	17	5	94
Industry	119	278	322	232	254	253	232	194	1,884
Academia	3	18	13	12	15	10	7	4	85
Foreign	9	6	12	11	9	12	9	8	85
By Response Type									
Technical	107	232	259	181	199	196	209	172	1,555
Bibliographic	40	106	122	100	109	112	92	66	747
DoD Related									
Number	--	--	162	121	153	152	151	87	
Percent	--	65	42.5	43.1	49.7	4.94	50.2	36.6	
Charged									
Number	23	54	80	56	63	61	49	25	411
MCIC Income	\$2,548	\$8,185	\$9,473	\$5,432	\$5,500	\$8,801	\$4,788	\$2,659	\$47,386

(1) 15 Jun 83 to 30 Sep 83

(2) 1 Oct 89 to 15 Aug 90



- *Structural Alloys Handbook* (SAH). Three-volume set with semi-annual updating.

Since the initiation (in 1972) of the practice of charging for documents, 79 documents were generated. Of those, 68 were carried as available publications through the final contract period.

The sale of documents was conducted by MCIC and through marketing agreements with nine organizations:

NTIS (worldwide)  
 American Ceramic Society  
 Metal Powder Industries Federation (U.S. Only)  
 Neutrino/MRI (Japan)  
 Allied Publishers Private, Ltd. (India)  
 Aluminium Verlag GmbH (West Germany)  
 Information Handling Services (Worldwide)  
 American Institute of Aeronautics and Astronautics  
 Battelle Press

Several of these organizations were interested in only the ASMH and SAH or other specific documents.

Purchasers of documents classified as containing critical technology information or data were required to file a DD Form 2345 with the Defense Logistics Services Center in Battle Creek, Michigan. Export-controlled reports were sold only after the customer was registered by the Center and a copy of the approved form had been received by MCIC.

Also, all of MCIC's publications were available on 16-mm film through a service offered by Information Handling Services. MCIC received royalties on the rental of these films. MCIC documents on film were subjected to the same distribution restrictions as the original publications.

Documents subject to export controls were handled only by MCIC and Information Handling Services. (IHS is aware of limited distribution and export control requirements.)

#### FY1990

A summary of publications produced during FY 1990 is given in Table 5. Six supplements to the ASMH were issued to cover the second half of calendar year (CY) 1989 and all of CY 1990. Two supplements to the *Structural Alloys Handbook* (SAH) were issued for the second half of CY 1988 and all of CY 1989. The 1989 SAH supplement was an extensive coverage of the 2-1/4-Cr-1 Mo type of steels and was also sold as a separate publication. In view of the incremental time extensions at the end of the contract, combined with the time required for preparation of supplements, no SAH supplements were issued for CY 1990.

TABLE 5. PUBLISHED UPDATES TO MCIC HANDBOOKS (FY-1990)

Chapter Code	Chapter Title	New (N) Revision (R)	Cumulative		Contract	Mailed	Notes
			Costs Report Period	Costs This			
AEROSPACE STRUCTURAL METALS HANDBOOK							
1228	T-250 Steel	N	\$ 7,213	\$ 7,213		5/3/90	Fourth supplement, 1989
3224	2090 Al	N	\$ 7,225	\$ 7,225		6/5/90	First supplement, 1990
3225	8090 Al	N	\$13,609	\$13,609		7/13/90	Second supplement, 1990
4219	Incoloy 909	N	\$10,416	\$10,416		4/11/90	Third supplement, 1989
5101	Beryllium	R	\$16,440	\$16,440		9/5/90	Third supplement, 1990
3305	IN905X Al	N	\$ 8,800	\$ 8,800		9/5/90	Fourth supplement, 1990
STRUCTURAL ALLOYS HANDBOOK							
1427	6063/6463 Al	N	\$ 2,031	\$11,350		10/31/89	Second supplement for 1988
1426	2-1/4 Cr-1Mo Steel	N	\$27,469	\$34,176		3/12/90	1989 supplement
SPECIAL TASK							
--	Update of the Hand- book of International Alloy Compositions and Designations, Vol. 1, Titanium	R	\$40,967	\$49,967		Published August, 1990	

The revision of MCIC HB-09, *International Handbook of Alloy Compositions and Designations - Volume 1, Titanium* was completed in August, 1990, and sales initiated as soon as the document was available.

With the approval of the Contracting Agency, sales of MCIC publications were continued through 30 September, hence, the reported sales figures for the first quarter are reported only through 15 Aug 90.

The total number sold during FY-1990 included:

FY-1990

37	Structural Alloys Handbook (SAH)
107	SAH Supplements
58	Aerospace Structural Metals Handbook (ASMH)
637	ASMH Supplements
53	Technical Reports
208	Other Handbooks/Databooks
<u>21</u>	Special Documents
1,118	Total Documents

Appendix E presents a detailed list of the various documents sold during FY-1990.

Contract Period

MCIC publications during the contract period are listed in Table 6. These documents were generated within the contract, under special tasks, or acquired from other contracts and published and marketed by MCIC.

The supplements to the *Aerospace Structural Metals Handbook* and the *Structural Alloys Handbook* generated during the contract period are listed in Table 7. These included 30 quarterly supplements to the ASMH covering 43 alloys and amounting to 1,419 pages of compiled information, and semi-annual supplements to the SAH covering both specific alloys and classes of related alloys in a total of 593 pages of technical data and materials selection guides.

A summary of the total numbers of technical publications sold during the contract period is given in Table 8, by type of publication and time period. Sales of handbooks (including the ASMH and SAH), reports, and special documents amounted to over 6,500 items. The numbers listed for sales of supplements to the ASMH and SAH are subscriptions for yearly services, and total slightly over 6,300 subscriptions for both handbooks.

TABLE 6. ADDITIONS TO MCIC PUBLICATIONS DURING THE CONTRACT PERIOD

Supplement Year Month	Code	Title	Number of Pages
<u>HANDBOOKS</u>			
1984 Jul	HB-OIR <sup>(a)</sup>	Damage Tolerant Design Handbook	3294
1990 Aug	HB-09VIR	Handbook of International Alloy Compositions and Designations, Volume 1-Titanium (Revised)	752
<u>STATE OF THE ART REPORTS</u>			
1983 Jun	83-47 <sup>(b)</sup>	Isothermal and Hot Die Forging of High Temperature Alloys	125
1983 Sep	83-48 <sup>(b)</sup>	Laser Processing of Materials	176
1984 Mon	84-49 <sup>(b)</sup>	Rapid Solidification of Ceramics	66
1986 Aug	86-50	Corrosion of Metals in Marine Environments	800
1986 Jun	86-51	Ceramic-Ceramic Composites	53
1986 May	86-C1 <sup>(c)</sup>	Corrosion of Electrical Connectors	60
1986 Aug	86-C2 <sup>(c)</sup>	Thermal Barrier Coatings for Engine Applications	21
<u>SPECIAL DOCUMENTS</u>			
1984 Nov	MCMC-1	Metal and Ceramic Matrix Composite Conference Proceedings	53
1986 Aug	TRIAC	Conference on Nondestructive Testing and Evaluation of Advanced Materials and Composites	258

- (a) Compiled under a separate contract published and sold by MCIC.  
 (b) Initiated during the preceding contract.  
 (c) Prepared under Corrosion Information and Analysis Special Task.

TABLE 7. HANDBOOK SUPPLEMENTS PRODUCED DURING THE CONTRACT

Supplement Year	Month	Chapter Code	Chapter Title	Number of Pages
<u>Aerospace Structural Metals Handbook</u>				
1983	Jun	3217	7049 Aluminum	30
	Sep	3220	7475 Aluminum	31
	Dec	4112	Hastealloy X	23
1984	Mar	4217	IN-738	25
	Jun	3222	7050 Aluminum	46
	Sep	4214	Rene 80	18
	Dec	4218	Mar-M-247	21
1985	Mar	4213	B-1900	34
	Jun	4207	Udimet 700	41
	Sep	3219	7175 Aluminum	19
	Sep	4311	Mar-M-509	26
	Dec	1311	19-9 DL Stainless Steel	12
	Dec	4305	Stellite 31	37
1986	Mar	1306	Type 314 Stainless Steel	8
	Mar	4302	L-605	37
	Jun	1209	E9310 Steel	12
	Jun	4103	Inconel 718	58
	Sep	1214	Hy-Tuf Steel	12
	Sep	4208	Wassaloy?	36
	Dec	1215	Nitralloy 135 Mod	8
	Dec	4310	Haynes Alloy 188	40
1987	Mar	1203	4140 Steel	34
	Mar	1601	A-286 Steel	37
	Jun	1221	9 Ni-4Co Steel	101
	Jun	1312	Type 201 Stainless Steel	9
	Sep	1213	D6A, D6AC Steel	46
	Sep	1217	300 M Steel	34
	Dec	1220	10Ni Managing Steel	
	Dec	1308	Type 321 Stainless Steel	

TABLE 7. HANDBOOK SUPPLEMENTS PRODUCED DURING THE CONTRACT (Continued)

Supplement Year Month	Chapter Code	Chapter Title	Number of Pages
1988 Mar	1301	Types 301 & 302 Stainless Steel	68
Mar	1401	Types 403, 410 & 416 Stainless Steel	34
Jun	1307	Types 316 & 317 Stainless Steel	63
Jun	1510	PH 13-8 Mo Stainless Steel	33
Sep	1205	4335V Mod Steel	36
Dec	1201	4130 Steel	48
1989 Mar	3109	357, A357 Aluminum	40
Jun	1602	N-155 Steel	21
Sep	4219	Incoloy 909	13
Dec	1228	Managing T-250 Steel	19
1990 Mar	3224	2090 Aluminum	32
Jun	3225	8090 Aluminum	35
Sep	5101	Beryllium	15
Dec	3305	Al 905XL Aluminum	20
<u>Structural Alloys Handbook</u>			
1983 Jun	--	Wrought Aluminum Alloy Selector Chart	14
Dec	--	Structural Steel Selector Chart	52
1984 Jun	--	Guide to Selection of Structural Steels	35
Dec	--	UNS 520000 Cr-Mn Stainless Steels	90
1985 Jun	--	A572 and Related Steels	67
Dec	--	A633 and Related Steels	41
1986 Jun	--	Ductile Iron	61
Dec	--	A710 and Related Steels	86
1987 Jun	--	Duplex Stainless Steels	36
Dec	--	Nickel Steels	41
1988 Jun	--	Copper-Nickel Alloys	37
Dec	--	6063/6461 Aluminum Alloys	15
1989 Jun/Dec	--	2-1/4 Cr-1Mo Steels	68

TABLE 8. PUBLICATIONS SALES DURING THE CONTRACT PERIOD

Time Period	MCIC Handbooks	MCIC Reports	Special Documents	Aerospace Structural Metals Handbook		Structural Alloys Handbook	
				Hand- books	Supple- ments	Hand- books	Supple- ments
4Q1983	52	148	6	33	38	7	12
FY84	714	750	9	63	570	24	279
FY85	644	447	84	73	513	59	345
FY86	568	303	44	67	511	23	292
FY87	370	310	28	68	705	25	295
FY88	429	169	33	65	694	31	294
FY89	263	81	21	106	727	50	289
FY90	<u>208</u>	<u>53</u>	<u>21</u>	<u>58</u>	<u>637</u>	<u>37</u>	<u>104</u>
Totals	3,248	2,261	246	533	4,395	256	1,910

Total income from the sales of Handbooks and State-of-the-Art Reports was more than \$1,424,446. (Final income was not available at the time this report was prepared.)

CURRENT AWARENESS  
(Gerald O. Davis, Editor)

The monthly MCIC Current Awareness Bulletin (CAB) was designed to fulfill the MCIC contract requirement to keep its users aware of important current technical developments within the Center's materials, properties, and processes scope. Over the course of this contract many scientists and engineers at Battelle with special expertise in various materials fields presented special articles covering the pertinent literature and technical meetings or the state of the art of technical subjects of particular interest to the DoD materials community. Contributors to the CAB during this reporting period are shown in Appendix C.

One issue of the CAB was prepared during the final quarter of FY-1990. Critical reviews of 11 published references were prepared.

The CAB was provided upon written request without charge to U.S.-based users of the Center. The distribution at the end of the contract was to 4,240 subscribers, categorized as follows:

Industrial	2,956
Foreign (TTCP, Canada)	5
DoD	558
Other Government	258
Academic	463

This user list was provided to the Contractor for the Centers that will replace MCIC.

CONTRACT STATUS REPORT

In compliance with the Contract and as requested by the DTIC IAC Program Office, person-hours and financial statistics for the fourth quarter, current fiscal year, and the cumulative contract period (through 30 August 1990) are presented in several tables as described below.

The expended professional and non-professional person-hours are in accordance with Battelle definition. Outside (subcontracted) consulting and support hours are not included in the person hours shown; the costs for such efforts are included in the "Cost Incurred" section. Direct costs cover labor only; indirect costs include costs other than staff time, such as overheads, burdens, materials, travel, subcontracting, etc.



### Financial Summary

Tables 9, 10, and 11 give the Financial Statistics for the current quarter, fiscal year, and the cumulative contract period through 30 August 1990 respectively. The tables are generated in compliance with Form 388. Because the contract was completed on 15 August 1990, the final financial status reports will be submitted upon the completion of all special tasks.

Tables 12, 13, and 14 illustrate the funding and expenditure summaries as follows:

Table 12 - Program Funding and Income Summary. The details for both core and special task funding are presented by month, current quarter, current fiscal year, and total contract period. Cumulative and authorized contract funding are compared.

Table 13 - Program Expenditure and Billing Summary. Net Bill amounts, dates of submission, and payment of invoices are shown for items that fall within the current quarter and other pertinent time periods.

Table 14 - Fiscal Report. Income and expenditures for the current quarter and cumulative contract period are presented. Expenditures include the fixed fee prorated to the Baseline and Special Task net expenditures. (Appendix E contains the breakdown for July and August.)

The funding is also shown in Figure 1 as a function of the month in which it was received. The actual expenditures are also summarized in Table 15. The professional and non-professional core hours are also shown in this table. The last column (Core Expenditures divided by Total Dollars) also reflects the effects of increasing the professional hours and inflation. This last column is directly related to the diminution of services that must occur with level funding.

### Travel

The following core and special task travel was undertaken as required during this quarter. Travel on the core funding was reduced to a minimum to conserve project funds. When possible, trips were coordinated with other Battelle travel to minimize project costs.

### Core Operations

#### Information

-- IAC Manager Meeting  
Laurel, MD

1-2 August 1990  
H. Mindlin

TABLE 9. FINANCIAL STATISTICS (FOURTH QUARTER, FY90)

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT		METALS AND CERAMICS INFORMATION CENTER (Contract No. DLA900-83-C-1744)			Quarter Totals through 30 August 1990 4TH QUARTER - FY1990			
AREA TITLE		OUTPUT UNITS PRODUCED	MANHOURS EXPENDED		COSTS INCURRED		INCOME	
			Pro- fessional	Non-Pro- fessional	Total	Direct		Indirect
1. ACQUISITION AND INPUT OF SOURCE INFORMATION			345.50	267.00	612.50	\$12,542	\$17,760	\$30,302
a. Documents Acquired		331						
b. Documents Reviewed		331						
c. Documents Cataloged		315						
2. TECHNICAL INQUIRY RESPONSES PROVIDED		24	108.50	3.50	112.00	\$4,752	\$6,730	\$11,481
3. BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED		8	3.00	2.00	5.00	\$132	\$268	\$400
4. HANDBOOKS/DATA BOOKS COMPLETED								
a. New Chapters/Pages Completed		2/45						
b. Revised Chapters/Pages Completed		1/753	172.50	56.00	228.50	\$8,137	\$32,218	\$40,355
c. Data Sets Compiled		0						\$7,731
5. STATE-OF-THE-ART STUDIES COMPLETED		0	0.00	0.00	0.00	\$0	\$0	\$2,119
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED		0						
7. CURRENT AWARENESS AND PROMOTION EFFORTS								
a. Number Newsletters and/or Announcements Published		2						
b. Number Meetings, Conferences, Etc. Supported		1 (1)	54.00	301.50	355.50	\$5,012	\$14,579	\$19,591
8. OTHER (Special Tasks)		0 (1)	622.00	727.50	1349.50	\$36,169	\$166,102	\$202,271
9. MANAGEMENT AND SUPPORT			164.00	124.50	288.50	\$9,691	\$14,749	\$24,440
10. UNASSIGNABLE INDIRECT COSTS (Contractual Fee)							\$22,496	\$22,496
11. TOTAL			1469.50	1482.00	2951.50	\$76,434	\$24,903	\$79,906

Note: (1) Items 7.b. and 8. are incomplete; final figures not available.

TABLE 10. FINANCIAL STATISTICS (FY-1990)

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT	AREA TITLE	OUTPUT UNITS PRODUCED	METALS AND CERAMICS INFORMATION CENTER (Contract No. DLA900-83-C-1744)			COSTS INCURRED		Current Through 30 AUGUST 1990
			Pro- fessional	MANHOURS EXPENDED Non-Pro- fessional	Total	Direct	Indirect	INCOME
1. ACQUISITION AND INPUT OF SOURCE INFORMATION			2370.00	1860.75	4230.75	\$92,798	\$139,393	\$232,192
a. Documents Acquired		2602						
b. Documents Reviewed		2602						
c. Documents Cataloged		2430						
2. TECHNICAL INQUIRY RESPONSES PROVIDED		172	601.50	20.50	622.00	\$26,340	\$37,274	\$63,614
3. BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED		66	68.50	15.00	83.50	\$2,537	\$3,914	\$6,452
4. HANDBOOKS/DATA BOOKS COMPLETED								
a. New Chapters/Pages Completed		7/218						
b. Revised Chapters/Pages Completed		1/759						
c. Data Sets Compiled		0	634.00	229.75	863.75	\$29,849	\$127,049	\$156,898
5. STATE-OF-THE-ART STUDIES COMPLETED		0	0.00	0.00	0.00	\$0	\$0	\$11,752
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED		0						
7. CURRENT AWARENESS AND PROMOTION EFFORTS								
a. Number Newsletters and/or Announcements Published		11	394.50	1927.75	2322.25	\$33,943	\$87,597	\$121,540
b. Number Meetings, Conferences, Etc. Supported		37 (1)						
8. OTHER (Special Tasks)		18 (1)	8910.50	4698.75	13609.25	\$397,968	\$1,133,065	\$1,531,031
9. MANAGEMENT AND SUPPORT			479.75	773.50	1253.25	\$34,479	\$50,680	\$85,159
10. UNASSIGNABLE INDIRECT COSTS (Contractual Fee)							\$147,864	\$147,864
11. TOTAL			13458.75	9526.00	22984.75	\$617,913	\$1,726,838	\$2,344,750
								\$749,870

Note: (1) Items 7, b, and 8, are incomplete; final figures not available.

TABLE 11. CUMULATIVE FINANCIAL STATISTICS  
(15 June 1983 through 30 August 1990)

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT		METALS AND CERAMICS INFORMATION CENTER (Contract No. DLA900-83-C-1744)			CUMULATIVE through 30 AUGUST 1990		
AREA TITLE	OUTPUT UNITS PRODUCED	MANHOURS EXPENDED Pro- fessional	Non-Pro- fessional	Total	DIRECT	INDIRECT	TOTAL
1. ACQUISITION AND INPUT OF SOURCE INFORMATION		13265.50	24004.00	37269.50	\$655,854	\$986,829	\$1,642,684
a. Documents Acquired	20,257						
b. Documents Reviewed	20,257						
c. Documents Cataloged	18,943						
2. TECHNICAL INQUIRY RESPONSES PROVIDED	1,555	4818.25	408.75	5227.00	\$162,862	\$229,550	\$392,412
3. BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED	744	1050.50	382.50	1433.00	\$33,826	\$49,494	\$83,321
4. HANDBOOKS/DATA BOOKS COMPLETED							
a. New Chapters/Pages Completed	16/873						
b. Revised Chapters/Pages Completed	39/1902						
c. Data Sets Compiled	1/3294						
5. STATE-OF-THE-ART STUDIES COMPLETED	6	2878.00	1480.25	4158.25	\$94,914	\$214,765	\$309,680
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED	0						
7. CURRENT AWARENESS AND PROMOTION EFFORTS	122	7116.75	16929.75	24046.50	\$370,981	\$835,192	\$1,206,173
a. Number Newsletters and/or Announcements Published							
b. Number Meetings, Conferences, Etc. Supported	403 (1)						
8. OTHER (Special Tasks)	52 (1)	65123.00	28720.25	93843.25	\$2,421,532	\$6,262,011	\$8,683,544
9. MANAGEMENT AND SUPPORT		5182.75	9611.00	14793.75	\$318,689	\$550,678	\$869,367
10. UNASSIGNABLE INDIRECT COSTS (Contractual Fee)						\$928,381	\$928,381
11. TOTAL		107959.75	88025.50	195985.25	\$4,384,622	\$11,218,285	\$15,602,907

Note: (1) Items 7.b. and 8. are incomplete; final figures not available.

TABLE 12. PROGRAM FUNDING AND INCOME SUMMARY (through 30 August 1990)

Period	MCIC			Special Tasks			Total Available Funding
	Core	Income	Total	MIPR	Income	Total	
June 90	\$0	\$8,243	\$8,243	\$75,994	\$0	\$75,994	\$84,237
July 90	\$0	\$5,710	\$5,710	\$69,588	\$0	\$69,588	\$75,299
August 90	\$0	\$4,608	\$4,608	\$0	\$0	\$0	\$4,608
Fourth Quarter Total	\$0	\$18,561	\$18,561	\$69,588	\$0	\$69,588	\$79,906
FY1990 Total	\$447,000	\$115,626	\$562,626	\$634,244	\$0	\$634,244	\$1,196,870
Contract							
Cumulative	\$4,585,964	\$1,710,030	\$6,295,995	\$9,394,782	\$243,851	\$9,638,633	\$15,934,628
Authorized	\$4,585,964	\$12,182,866 (1)					\$16,768,831

Notes: (1) All Products and Services including Special Tasks. Actual total = \$11,348,663.47

TABLE 13. PROGRAM EXPENDITURE AND BILLING SUMMARY (through 30 August 1990)

Period	MCIC				Special Tasks			Total Contract			Net Billing		
	Core Operations	Less Income	Net Costs	Total Costs	Less Income	Net Costs	Net Expenditures	Fee Costed	Net Total	Date Submitted	Amount	Date Paid	
June 90 Net Billing	\$57,460	\$8,243	\$49,217	\$106,976	\$0	\$106,976	\$156,192	\$10,966	\$167,159		\$387,719		
							\$156,192	\$4,216	\$160,408	2 Jul 90	\$160,408	29 Jun 90	
July 90 Net Billing	\$49,867	\$5,710	\$44,157	\$64,857	\$0	\$64,857	\$109,014	\$7,672	\$116,686		\$160,408		
							\$109,014	\$4,436	\$113,450	30 Jul 90	\$113,450	19 Jul 90	
August 90 Net Billing	\$76,702	\$4,608	\$72,095	\$137,414	\$0	\$137,414	\$209,509	\$14,824	\$224,333		\$113,450		
							\$209,509	\$0	\$209,509	9 Sep 90	\$209,509	22 Aug 90	
Fourth Quarter Total	\$126,569	\$10,318	\$116,251	\$202,271	\$0	\$202,271	\$318,523	\$22,496	\$341,019				
Net Billing							\$474,715	\$8,652	\$483,367				
Amount Paid									\$273,859				
FY1990 Total	\$665,855	\$115,826	\$550,229	\$1,531,031	\$0	\$1,531,031	\$2,081,280	\$147,864	\$2,229,124				
Net Billing							\$2,251,211	\$91,377	\$2,342,588				
Amount Paid									\$2,344,919				
Contract Cumulative													
Net Billing	\$5,990,983	\$1,710,030	\$4,280,952	\$8,683,544	\$243,851	\$8,439,693	\$12,730,501	\$928,381	\$13,658,881				
Amount Paid							\$12,708,716	\$807,903	\$13,516,619				
Authorized							\$12,499,207	\$807,903	\$13,307,111				
							\$15,633,036	\$1,135,498	\$16,768,534				

TABLE 14. FOURTH QUARTER FISCAL REPORT (through 30 August 1990)

Contract DLA900-83-C-1744		Current Period: 29 Jun 90 to 30 Aug 90				Cumulative Period: 15 Jun 83 to 30 Aug 90			
Program Element		Income		Expenditures		Cumulative Balance			
		Current	Cumulative	Current	Cumulative				
Baseline		\$10,317.99	\$6,285,994.71	\$134,791.37	\$6,303,341.00	(\$7,346.29)			
Direct Funds		\$0.00	\$4,585,964.43						
Government Block Funds		\$0.00	\$0.00						
Subscriptions/Sales		\$10,317.99	\$1,710,030.28						
Special Tasks		\$69,588.28	\$9,638,633.19	\$216,545.27	\$9,299,565.97	\$339,067.22			
	(1)								
Total Program		\$79,906.27	\$15,934,627.90	\$351,336.64	\$15,602,966.97	\$331,720.93			

(1) MIPR \$9,394,782.47  
Subscriptions and Conference Registration Fees \$243,850.72

TABLE 15. SUMMARY OF EXPENDITURES AND PERSON-HOURS

Period	Core Expenditures	Person-Hours		Core Expenditures/ Total Hours
		Professional	Non-Professional	
FY-84	\$1,088,724	8,221	11,065	56.45 \$/HR
FY-85	1,095,696	8,255	11,467	55.56
FY-86	806,770	4,966	8,200	61.28
FY-87	735,546	4,653	6,598	65.38
FY-88	953,658	5,273	6,508	80.95
FY-89	902,006	4,621	7,043	77.33
FY-90 (thru 30Aug90)	813,719	4,548	4,827	84.11



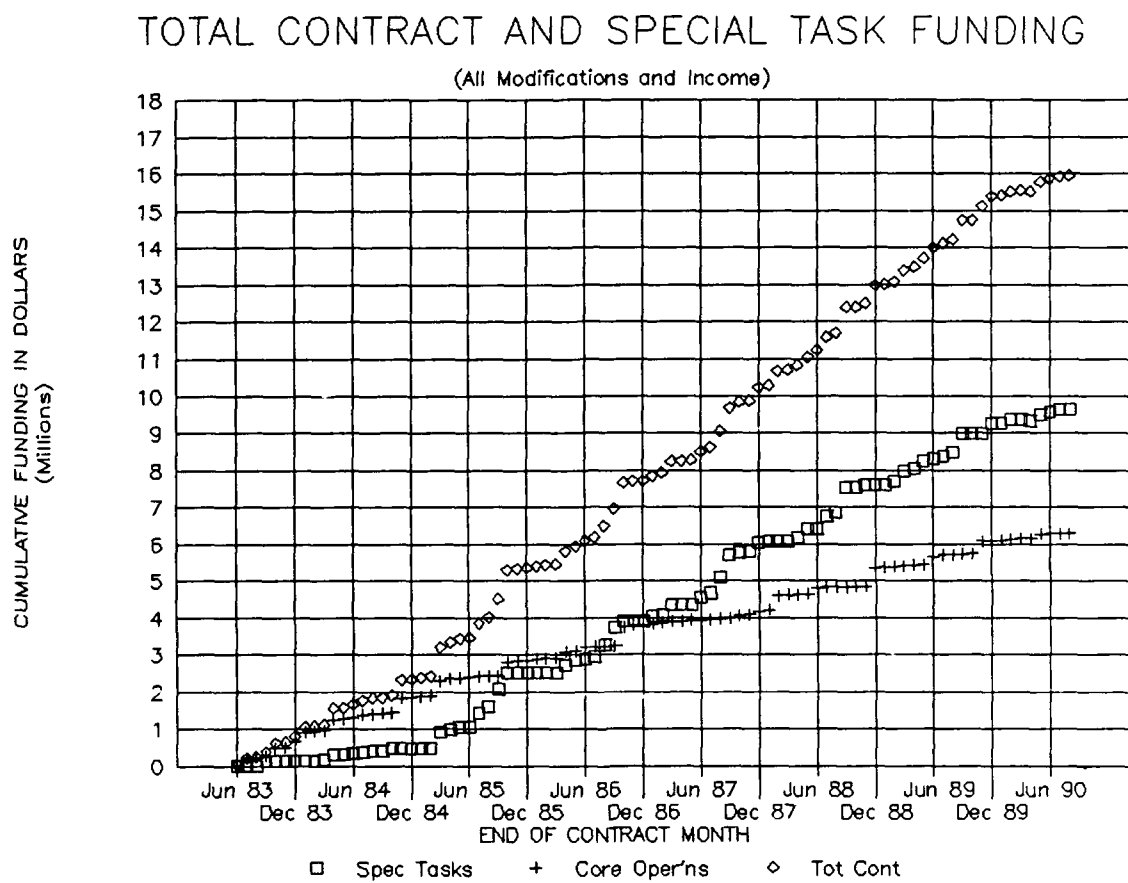


FIGURE 1. TOTAL CONTRACT FUNDING (through 30 August 1990)

### SPECIAL TASKS AND STUDIES

These special tasks or studies, undertaken as a function of a full-service Information Analysis Center, are within the Center's scope and utilize the applicable Battelle/MCIC resources to provide a rapid response to the technical requirements of the client. Under the management of MCIC, these tasks are assigned to researchers and scientists within Battelle who can best respond to the needs of the agency requesting our assistance. When required or requested by the client or when it appears more cost effective to go directly to data sources, outside consultants or services may be used.

The special tasks are continuing through January 1991 in order to respond to the requirements of the task Sponsors. A complete special task report will be submitted at that time.

### PROFESSIONAL STAFF

The key contributors to the operation of MCIC are too numerous to list for the entire contract period; the contributors for the last quarter are listed in Appendix C. During any reporting period individual contributions by other Battelle technical staff varied from the time required to answer an inquiry to the time required to write a technical report. The "full-service" feature of an IAC was represented by the breadth and depth of Battelle's support staff.

Key personnel who contributed to the Center core operations were:

Harold Mindlin, Program Manager and Special Task Manager

John B. Hallowell, Manager Publications and Promotion,  
Technical Inquiries

Gerald O. Davis, Editor, CAB

Helen Pestel, Manager, Information Services

Irene Russell and Paula Miner, Publications Handling  
and Mailing, Non-Technical Inquiries, Administration

APPENDIX A

TECHNICAL(-T) AND BIBLIOGRAPHIC (-B) INQUIRIES  
(FOURTH QUARTER FY-1990)

## ALL TECHNICAL AND BIBLIOGRAPHIC INQUIRIES

Inquiry Number	Organization	Inquiry	
5087-T	MICRONO ELECTRONICS ST PETERSBURG, FL	Request:	LUBRICANT FOR ALUMINA BUSHING/STAINLESS STEEL SHAFT
		Response:	DISCUSSED WITH BATTELLE STAFF
5088-T	ALTRAM CORPORATION BOSTON, MA	Request:	FRACTURE TOUGHNESS FOR ASTM A212, GRADE B
		Response:	NO INFORMATION FOUND IN MCIC. ALLOY USED IN NUCLEAR INDUSTRY
5089-B	MURDOCK ENGINEERING IRVING, TX	Request:	FATIGUE AND WELD PROPERTIES FOR SEVERAL STEELS
		Response:	TWO BIBLIOGRAPHIES GENERATED. SELECTED INFORMATION SENT.
5090-T	GENERAL MOTORS - EMD LAGRAIGE, IL	Request:	FRACTURE TOUGHNESS FOR SEVERAL AUTOMOTIVE MATERIALS
		Response:	SENT INFORMATION ON MCIC PUBLICATIONS AND SOURCES
5091-B	NAVAL ORDANCE STATION INDIAN HEAD, MD	Request:	BIBLIOGRAPHY ON SUBSTITUTES FOR CADMIUM PLATING
		Response:	SUPPLIED BIBLIOGRAPHY FROM MCIC SPECIAL TASK (F/U 8/9/90)
5092-T	TRW REDONDO BEACH, CA	Request:	"LOSS TANGENT" OR "LOSS FACTOR" FOR FOAMED CERAMICS
		Response:	VALUE FROM MCIC REFERENCE GIVEN BY PHONE
5093-T	NEED INSTRUMENT ROUND ROCK, TX	Request:	CORROSION OF TITANIUM IN SPECIFIC ENVIRONMENTS
		Response:	DISCUSSED WITH BATTELLE STAFF
5094-T	CLEVELAND STATE UNIVERSITY CLEVELAND, OH	Request:	PHYSICAL PROPERTIES OF Ti-6Al-4V
		Response:	GAVE VALUES FROM EXISTING COMPILATIONS
5095-T	NEFAC TOLLAND, CT	Request:	HIGH TEMPERATURE CORROSION OF YTTRIA-STABILIZED ZIRCONIA
		Response:	SUPPLIED SELECTED REFERENCES FROM EXISTING COMPILATION
5096-T	MSC/ENAS EGLIN AFB, FL	Request:	FRACTURE DATA FOR AISI 52100 ALLOY STEEL
		Response:	COPY OF SELECTED DATA FAXED
5097-T	LOCKHEED MISSILES & SPACE CO PALO ALTO, CA	Request:	PROPERTIES OF BORON NITRIDE AT CRYOGENIC TEMPERATURES
		Response:	SENT COPIES OF AVAILABLE DATA
5098-T	NASA MOFFETT FIELD, CA	Request:	WEAR BEHAVIOR BETWEEN ALUMINUM 7075 AND BUTA RUBBER SEAL
		Response:	DISCUSSED PROBLEM WITH BATTELLE STAFF
5099-B	SAINT-GOBAIN RECHERCHE FRANCE	Request:	BIBLIOGRAPHY ON GENERAL MATERIALS (KEY WORD LIST)
		Response:	GENERATED NUMBERS OF HITS IN EACH CATEGORY
5100-T	UPREARE INC HANOVER, NH	Request:	FATIGUE PROPERTIES TITANIUM ALLOYS AT CRYOGENIC TEMPERATURES
		Response:	SENT SELECTED DATA FROM EXISTING COMPILATION
5101-B	BATTELLE COLUMBUS DIVISION COLUMBUS, OH	Request:	LITERATURE SEARCH ON CRACK-GROWTH TERMS
		Response:	MCIC AND DIALOGUE SEARCHED (11 HITS)
5102-T	JOHN B LOLLY INC SEATTLE, WA	Request:	INFORMATION ON SOVIET ALLOY PT-M
		Response:	FAXED DATA FROM EXISTING COMPILATION
5103-B	ARGO TECHNOLOGY CORP CLEVELAND, OH	Request:	FATIGUE AND FRACTURE DATA FOR EIGHT MATERIALS
		Response:	SEARCH SHOWED NO DATA FOR SPECIFIC ALLOYS AND MT COMBINATION

## ALL TECHNICAL AND BIBLIOGRAPHIC INQUIRIES

Inquiry Number	Organization	Inquiry	
5104-T	INTERCONTAL, INC FT LAUDERDALE, FL	Request:	FEDERAL SPEC QQ-C-450
		Response:	FAXED SELECTED PAGES
5105-T	NSD/EIAS EGLIN AFB, FL	Request:	EFFECT OF SULFUR CONTENT ON FRACTURE TOUGHNESS 17-4PH
		Response:	NO INFORMATION FOUND
5106-T	BUCKEYE PRODUCTS ADRIAN, MI	Request:	CASTING OF ALUMINUM ALLOYS
		Response:	DISCUSSED WITH BATTELLE STAFF MEMBER
5107-T	CONSOLIDATED INSTRUMENT PETERBORO, NJ	Request:	CHOICE OF MATERIALS FOR GEARS RUNNING AGAINST 2024-T3
		Response:	DISCUSSED WITH BATTELLE STAFF MEMBER
5108-B	SARGEANT AEROSPACE CORBA LINCA, CA	Request:	COST ESTIMATE FOR BIBLIOGRAPHY - FATIGUE 2024-T351
		Response:	QUOTE GIVEN FOR 25 - 30 HITS
5109-T	GENERAL DYNAMICS POMONA, CA	Request:	TUNGSTEN AND CERAMIC COATING FOR ROCKET ENGINE
		Response:	FOUND NO SIGNIFICANT REFERENCES SINCE 1975
5110-T	NAVAL AVIATION DEPOT ALAMEDA, CA	Request:	PHYSICAL PROPERTIES OF ALUMINUM ALLOY 256-T6
		Response:	FOUND SOME PROPERTIES WHICH INQUIRER HAS
5111-T	CODDENTAL CHEMICAL DALLAS, TX	Request:	INFORMATION ON RUSSIAN STEELS (2)
		Response:	IDENTIFIED ONE AND DISCUSSED ALLOYS SIMILAR TO OTHER
5112-T	CORNING INC CORNING, NY	Request:	ELECTROLYTIC NICKEL-TUNGSTEN COATINGS ON STAINLESS STEEL
		Response:	UNABLE TO COMPLETE DUE TO CLOSE OF CONTRACT
5113-T	TEXTRON MARINE SYSTEMS NEW ORLEANS, LA	Request:	BRITISH ALLOYS 4520TF, HT30TF, HE30
		Response:	GAVE COMPOSITION AND STRENGTHS; DISCUSSED 6061-T6
5114-T	US ARMY CORPS OF ENGINEERS ST PAUL, MN	Request:	STEEL SPECIFICATIONS QQ-S-753 AND -756
		Response:	MAILED COPIES OF SPECS
5115-T	ALLIED SIGNAL, AEROSPACE SOUTH BEND, IN	Request:	EFFECT OF SHOT PEENING OF FATIGUE, LOW ALLOY STEELS
		Response:	UNABLE TO COMPLETE DUE TO CLOSE OF CONTRACT
5116-B	LTV AIRCRAFT PRODUCTS GROUP DALLAS, TX	Request:	BIBLIOGRAPHY ON FATIGUE OF 2 T1 ALLOYS
		Response:	UNABLE TO COMPLETE DUE TO CLOSE OF CONTRACT
5117-B	GENERAL DYNAMICS POMONA, CA	Request:	BIBLIOGRAPHY ON REFRACTORY-METAL-COATED C/C COMPOSITES
		Response:	UNABLE TO COMPLETE DUE TO CLOSE OF CONTRACT
5118-T	NSD/EIAS EGLIN AFB, FL	Request:	EFFECT OF TRAP METAL IMPURITIES ON WELDABILITY OF 4140
		Response:	UNABLE TO COMPLETE DUE TO CLOSE OF CONTRACT

Best Available Copy

APPENDIX B

FREE TECHNICAL (-T) AND BIBLIOGRAPHIC (-B) INQUIRIES  
(FOURTH QUARTER FY-1990)

## FREE INQUIRY SERVICES

Inquiry Number	Organization	No-Charge Reason
5087-T	MICROMO ELECTRONICS ST PETERSBURG, FL	Minimal time : 1 hour
5088-T	ALTRAN CORPORATION BOSTON, MA	No information available
5090-T	GENERAL MOTORS - EMD LAGRANGE, IL	No information available
5091-B	NAVAL ORDNANCE STATION INDIAN HEAD, MD	DoD agency
5092-T	TRW REDONDO BEACH, CA	Minimal time : 1 hour
5093-T	WEED INSTRUMENT ROUND ROCK, TX	Minimal time : 1 hour
5094-T	CLEVELAND STATE UNIVERSITY CLEVELAND, OH	Minimal time : 1 hour
5095-T	HERAC TOLLAND, CT	Minimal time : 1 hour
5096-T	MSD ENAS EGLIN AFB, FL	DoD agency
5097-T	LOCKHEED MISSILES & SPACE CO PALO ALTO, CA	Minimal time : 1 hour
5098-T	NASA MOFFETT FIELD, CA	Minimal time : 1 hour
5099-B	SAINT-GOBAIN RECHERCHE FRANCE,	Minimal time : 1 hour
5100-T	CREARE INC HANOVER, NH	Minimal time : 1 hour
5101-T	JOHN B JOLLY INC SEATTLE, WA	Minimal time : 1 hour
5103-B	ARGO TECHNOLOGY CORP CLEVELAND, OH	No information available
5104-T	INTERCONTAL, INC FT LAUDERDALE, FL	Minimal time : 1 hour
5105-T	MSD ENAS EGLIN AFB, FL	DoD agency
5106-T	BUCKEYE PRODUCTS AURORA, MI	Minimal time : 1 hour

## FREE INQUIRY SERVICES

Inquiry Number	Organization	No-Charge Reason
5107-T	CONSOLIDATED INSTRUMENT TETERBORO, NJ	Minimal time (< 1 hour)
5108-B	SARGENT AEROSPACE YORBA LINDA, CA	Nonaffordable by user
5109-T	GENERAL DYNAMICS POMONA, CA	Minimal time (< 1 hour)
5110-T	NAVAL AVIATION DEPOT ALAMEDA, CA	DoD agency
5111-T	OCCIDENTAL CHEMICAL DALLAS, TX	Minimal time (< 1 hour)
5112-T	CORNING INC CORNING, NY	Contract completed
5113-T	TEXTRON MARINE SYSTEMS NEW ORLEANS, LA	Minimal time (< 1 hour)
5114-T	US ARMY CORPS OF ENGINEERS ST PAUL, MN	DoD agency
5115-T	ALLIED SIGNAL, AEROSPACE SOUTH BEND, IN	Contract completed
5116-B	LTV AIRCRAFT PRODUCTS GROUP DALLAS, TX	Contract completed
5117-B	GENERAL DYNAMICS POMONA, CA	Contract completed
5118-T	MSD/EMAS EGLIN AFB, FL	Contract completed



APPENDIX C

CONTRIBUTING TECHNICAL PERSONNEL  
(FOURTH QUARTER FY-1990)

APPENDIX C  
CONTRIBUTING TECHNICAL PERSONNEL  
(FOURTH QUARTER FY-1990)

<u>Personnel</u>	<u>Area of Specialization</u>
<u>BIBLIOGRAPHIC AND TECHNICAL INQUIRIES</u>	
Agrawal, A. K.	Corrosion
Glaeser, W. A.	Tribology
Green, C.	Bibliographic Inquiries
Hallowell, J. B.	Coordination and Materials Properties
House, L. J.	Physical Properties
Johnson, D.	Ceramics
Merryman, E. L.	Lubricants
Mindlin, H.	Mechanical Properties
Pestel, H.	Bibliographic Inquiries
Smith, C. G.	Plating
Tenaglia, R.	Casting
<u>CURRENT AWARENESS BULLETIN</u>	
Berry, W.	Corrosion
Davis, G. O.	CAB Editor
Fletcher, E. E.	Steels
Gurklis, J.	Surface Finishing
Marschall, C. W.	Light Metals

HANDBOOKS/DATABOOKS

Hallowell, J. B.	Editor and Coordination
Majumdar, B.	Steel Metallurgy
Walsh, W.	Metallurgy (Be-Alloys)
Brown, K. (Consultant)	Properties of Aluminum Alloys
Brown, W. (Consultant)	Properties of Metals, Tech. Editor
Kattus, J. (Consultant)	Properties of Metals

APPENDIX D

HANDBOOK AND TECHNICAL REPORT SALES  
FY-1990

TABLE D-1. HANDBOOK SALES -- FY-1990

MCIC      QUARTERLY      PUBLICATIONS      LISTING

FOR PERIOD 10/01/89    THRU    08/15/90

PUBLICATION		DOCUMENT	TITLE	NUMBER	NUMBER	NUMBER	NUMBER
NUMBER	DATE			SOLD (NTIS)	SOLD (MCIC)	SOLD (TOTAL)	SOLD (CUML)
BPMISC				0	0	0	6
HBO1	DEC72		DAMAGE TOLERANT DESIGN HANDBOOK (OBS)	0	0	0	1,429
HBO1R	JUL84		DAMAGE TOLERANT DESIGN HANDBOOK	0	18	18	471
HBO1S1	DEC73		1ST SUPP TO D-T-D HANDBOOK (OBS)	0	0	0	956
HBO1S2	JAN75		2ND SUPP TO D-T-D HANDBOOK (OBS)	0	0	0	857
HBO2	DEC72		TITANIUM ALLOYS HANDBOOK	0	3	3	1,289
HBO3	OCT73		FORGING--EQUIP, MATLS, + PRACTICES	3	37	40	2,324
HBO4	NOV74		HDBK ON MATLS FOR SUPERCONDUCTING MACH.	1	3	4	534
HBO4S1	NOV75		1ST SUPP TO HDBK ON M-S-M	0	2	2	404
HBO4S2	JAN77		2ND SUPP TO HDBK ON M-S-M	1	2	3	377
HBO5	OCT80		SOVIET ALLOY HANDBOOK -- 1980 ED	3	2	5	930
HBO5S1	APR76		1ST SUPP TO SOVIET ALLOY HDBK(OBS)	0	0	0	306
HBO6	DEC75		SEM/TEM FRACTOGRAPHY HANDBOOK	0	2	2	1,070
HBO7V1	MAR76		ENGRG PROP DATA ON CERAMICS-V1 NITRIDES	3	35	38	1,399
HBO7V2	AUG79		ENGRG PROP DATA ON CERAMICS-V2 CARBIDES	5	35	40	1,076
HBO7V3	JUL81		ENGRG PROP DATA ON CERAMICS-V3 SGLOXID	2	33	35	1,020
HBO8	JUN76		ELECTRON FRACTOGRAPHY HANDBOOK	1	1	2	516
HBO9V1	NOV76		HDBK OF INTNL ALLOY COMP+DESIG.-V1 TI	0	2	2	549
HBO9V2	DEC78		HDBK INTNL AL. COMP+DES- V2 SUPERALLOY	0	0	0	512
HBO9V3	OCT80		HDBK INTNL AL. COMP+DES- V3 ALUMINUM	0	13	13	715
HBO9VR	AUG90		HDBK OF INTNL ALLOY COMP+DESIG.-V1R	0	1	1	1
T O T A L				19	189	208	16,741

TABLE D-2. STATE-OF-THE-ART REPORT SALES -- FY-1990

M C I C      Q U A R T E R L Y      P U B L I C A T I O N S      L I S T I N G  
FOR PERIOD 10/01/89    THRU    08/15/90

PUBLICATION		D O C U M E N T	T I T L E	NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (CUML)
NUMBER	DATE						
7101	AUG71	EFF OF SURF COND ON MECH PROP TI+ALLOYS		0	1	1	1,061
7102	DEC71	EFF SHOT PEEN ON IMP, FAT+STR CORR PROP		1	1	2	1,327
7104				0	0	0	1
7203	JAN72	NONTRADITIONAL MACHINING OF BERYLLIUM		1	0	1	292
7204	JAN72	CRACK BEHAVIOR IN D6AC STEEL		1	1	2	450
7205	JAN72	SYMP ON PROP OF ELECT DEP METALS		1	1	2	955
7206	MAR72	IMPURITY EFFECTS IN BERYLLIUM		0	0	0	160
7207	JUN72	OXIDATION OF FE-NI + COBALT BASE ALLOYS		0	0	0	645
7208	JUN72	HOT CORROSION IN GAS TURBINES		0	1	1	713
7209	JUL72	BIBLIO ON FIBERS + COMP MATLS 1969-72		0	0	0	717
7210	SEP72	SUPERALLOYS-PROCESSING (CONF PROC.)		0	1	1	653
7211	SEP72	BETA TITANIUM ALLOYS		0	0	0	380
7212	DEC72	FRAC ANAL BY SCANNING ELEC MICRO(OBS)		0	0	0	1,529
7313	JAN73	ADV IN JOINING TECH - 60"S + BEYOND(OBS)		0	0	0	792
7314	JUN73	MATLS FOR USE IN AIRCRAFT GAS TURB ENG		0	1	1	748
7315	AUG73	METALLURGY OF FUSION-WELD REPAIR		1	0	1	710
7316	DEC73	TITANIUM CASTING TODAY		2	1	3	366
7319	DEC73	PROC 72 TRI-SERV CONF ON CORROSION		2	0	2	397
7324				1	0	1	1
7414				0	0	0	1
7417	APR74	PROC 73 SYMP ELEC-DEP METAL SEL APPLI		0	0	0	431
7418	FEB74	METAL IMPLANT FOR ORTHO+DENT SURG(OBS)		0	0	0	479
7420	JUN74	PROPERTIES OF TEXTURED TITANIUM ALLOYS		0	0	0	274
7421	JUL74	CERA PROSTH APPL-ORTHO DENT+CARDIO(OBS)		0	0	0	246
7422	JUL74	NONDESTRUCTIVE TESTING OF BERYLLIUM		0	0	0	118
7423	AUG74	CORROSION OF METALS IN THE ATMOSPHERE		0	2	2	668
7424	OCT74	AUTOMATION IN WELDING ( OBSOLETE )		0	0	0	285
7501				0	0	0	2
7525	MAR75	CRACKS AT STRUCTURAL HOLES		0	2	2	304
7526	JUN75	TITANIUM INDUSTRY IN THE MID 70"S		0	1	1	386
7527	JUL75	PROC 74 GAS TURB MATLS N MAR ENVIR CONF		0	2	2	323
7628	SEP76	PROC + APPLI OF DEPL URAN ALLOY PROD		0	1	1	171
7729	MAR77	ANNOT BIBLI SIL NIT FOR STRUC APPLI(OBS)		0	0	0	191
7730	APR77	DISPERSION STRENGTHENING OF METALS		0	0	0	344
7731	MAY77	LOW TEMP PROP SEL MATLS-BIBLIO W/DESCR		1	0	1	204
7732	JUN77	EFF RAP HEAT PROP MATLS-BIBLIO W/DESCR		0	0	0	312
7733	DEC77	PROC 76 TRI-SERV CONF ON CORROSION		1	0	1	224
7734	NOV77	HOT ISOSTATIC PROCESSING ( OBSOLETE )		0	0	0	1,198
7835	JAN78	RHEOCASTING		1	1	2	299
7836	MAR78	PROC DARPA/NAVSEA CER GASTURB DEM		0	1	1	566
7837	MAR78	CORROSION OF METALS IN MARINE ENVIRO		1	0	1	888
7838	NOV78	BIBLIO ON FIBERS + COMPOSITE MATLS		0	0	0	364
7939	APR79	REVIEW METALL HI-STREN LOW-ALLOY STEEL		0	0	0	473
7940	JUL79	TRI-SERV CORROSION CONF-78		0	0	0	234
7941	JUL79	SILICON NITRIDE BIB		1	1	2	272
8142	JUL81	CORR FATIGUE OF METALS IN MAR ENV		1	2	3	457
8143	OCT81	TECHNOLO. ADVAN. IN MATLS JOINING		1	1	2	244
8145	OCT81	RAPID SOLIDIFICATION TECHNOLOGY		0	0	0	286
8246	SEP82	HOT ISOSTATIC PROCESSING		0	0	0	325
8347	JUN83	ISOTHER & HOT-DIE FORG OF HI TMP ALLOY		0	0	0	105
8348	SEP83	LASER PROCESSING OF MATERIALS		0	0	0	110
8449	MAR84	RAPID SOLIDIFICATION OF CERAMICS		0	0	0	113
8550				0	0	0	2
8650	AUG86	CORR OF METALS IN MARINE ENVIRONMENTS		1	7	8	126
8651	JAN86	CERAMIC-CERAMIC COMPOSITES		0	0	0	139
86C1	MAY86	CORR OF ELECTRICAL CONNECTORS		0	3	3	96
86C2	AUG86	THERM BARRIER COATINGS FOR ENGINE APPL		0	3	3	113
MISC8P				0	0	0	7
SA86C2				0	0	0	1
T O T A L				18	35	53	23,278

TABLE D-3. SALES OF SPECIAL BOOKS AND DOCUMENTS -- FY-1990

MCIC      QUARTERLY      PUBLICATIONS      LISTING

FOR PERIOD 10/01/89    THRU    08/15/90

PUBLICATION		DOCUMENT	TITLE	NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (CUML)
NUMBER	DATE						
7502				0	0	0	2
7606				0	0	0	1
AMTC 1	OCT72	AMMRC BKS - SOLID TECH		0	15	15	146
AMTC 2	NOV73	AMMRC BKS - CERAMICS FOR HI PERF APPL I		0	2	2	150
AMTC 3	FEB74	AMMRC BKS - PHY MET URAN ALLOYS		0	0	0	85
AMTC 4	SEP75	AMMRC BOOKS - AMTC NO 4 - JOINING		0	2	2	370
AMTC 5	MAR77	AMMRC BKS - CERAMICS FOR HI PERF APPL II		0	2	2	294
BP-1	JAN88	ELECTIRC PROCESS HEATING		0	0	0	16
CBD		COMMERCE BUSINESS DAILY		0	0	0	11
FILM		MCIC		0	0	0	8
FILM 2		METALS AND CERAMICS IN PROSTHETICS		0	0	0	1
FILM 3		SCANNING ELECTRON MICROSCOPY		0	0	0	2
HELRG				0	0	0	6
HELRG2	JUL76	SURVEY ON MECH PROP ON RAPID HEATING		0	0	0	17
HELRG3	FEB78	SURV ON MECH PROP ON RAPID HEAT HDBK		0	0	0	13
MC155N				0	0	0	1
MCMC 1	NOV84	METAL & CERAMIC MATRIX COMP PROC CONF		0	0	0	60
MISC				0	0	0	1
MTC 78	FEB78	1978 MATERIALS TECHNOLOGY REPORT		0	0	0	251
SPEC	JUL79	MISC REPORTS		0	0	0	117
SR7501	FEB75	MATERIALS SHORTAGE WORKSHOP PROCEEDINGS		0	0	0	153
SR7502	JUL75	BERYLLIUM-UTILIZATION/AVAILABILITY		0	0	0	1
SR7606	MAR76	WORKSHOP ON GOVT POLICIES + PROGRAMS		0	0	0	288
STC 76	NOV76	1976 STRUCTURES TECHNOLOGY REPORT		0	0	0	352
TRIAC	AUG86	CONF ON TEST & EVAL OF ADV MATLS & COMP		0	0	0	29
T O T A L				0	21	21	2,375

( N O T E ) : NTIS DOES NOT SELL THESE DOCUMENTS.

TABLE D-4. SAH AND ASMH SALES -- FY-1990

MCIC      QUARTERLY      PUBLICATIONS      LISTING

FOR PERIOD 10/01/89    THRU    08/15/90

PUBLICATION		DOCUMENT	TITLE	NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (CUML)
NUMBER	DATE						
700079		ALLOY CROSS INDEX( 1979 )		0	0	0	25
700080		ALLOY CROSS INDEX( 1980 )		0	0	0	31
700081		ALLOY CROSS INDEX( 1981 )		0	1	1	129
800000		BINDER SET (SAH)		0	0	0	4
800001		BINDER VOL. 1 (SAH)		0	0	0	3
800002		BINDER VOL. 2 (SAH)		0	0	0	2
800079		STRUCTURAL ALLOYS HANDBOOK( 1979 )		0	0	0	45
800080		STRUCTURAL ALLOYS HANDBOOK( 1980 )		0	0	0	60
800081		STRUCTURAL ALLOYS HANDBOOK( 1981 )		0	0	0	58
800082		STRUCTURAL ALLOYS HANDBOOK( 1982 )		0	0	0	67
800083		STRUCTURAL ALLOYS HANDBOOK( 1983 )		0	0	0	34
800084		STRUCTURAL ALLOYS HANDBOOK( 1984 )		0	0	0	46
800085		STRUCTURAL ALLOYS HANDBOOK( 1985 )		0	0	0	39
800086		STRUCTURAL ALLOYS HANDBOOK( 1986 )		0	0	0	31
800087		STRUCTURAL ALLOYS HANDBOOK( 1987 )		0	0	0	41
800088		STRUCTURAL ALLOYS HANDBOOK( 1988 )		0	0	0	16
800089		STRUCTURAL ALLOYS HANDBOOK( 1989 )		0	21	21	61
800090		STRUCTURAL ALLOYS HANDBOOK( 1990 )		0	16	16	16
803089		SAH( 3RD SUP.-1989 SUBSCRIPTION )		0	0	0	3
803090		SAH( 3RD SUP.-1990 SUBSCRIPTION )		0	2	2	2
810079		SAH( 1979 SUPPLEMENT )		0	0	0	296
810080		SAH( 1980 SUPPLEMENT )		0	0	0	655
810081		SAH( 1981 SUPPLEMENT )		0	0	0	259
810082		SAH( 1982 SUPPLEMENT )		0	0	0	255
810083		SAH( 1983 SUPPLEMENT )		0	0	0	332
810084		SAH( 1984 SUPPLEMENT )		0	0	0	458
810085		SAH( 1985 SUPPLEMENT )		0	0	0	328
810086		SAH( 1986 SUPPLEMENT )		0	0	0	277
810087		SAH( 1987 SUPPLEMENT )		0	0	0	291
810088		SAH( 1988 SUPPLEMENT )		0	68	68	284
810089		SAH( 1989 SUPPLEMENT )		0	36	36	226
810090		SAH( 1990 SUPPLEMENT )		0	29	29	29
810886				0	0	0	1
811080		SAH( 1ST SUP.-1980 SUBSCRIPTION )		0	0	0	1
820089		SAH( SPECIAL EDITION )		0	13	13	13
900000		MISCELLANEOUS		0	0	0	29
900001		BINDER VOL. 1 (ASMH)		0	0	0	5
900002		BINDER VOL. 2 (ASMH)		0	0	0	9
900003		BINDER VOL. 3 (ASMH)		0	0	0	4
900004		BINDER VOL. 4 (ASMH)		0	0	0	6
900005		BINDER VOL. 5 (ASMH)		0	0	0	7
900079		ASMH( 1979 )		0	0	0	57
900080		ASMH( 1980 )		0	0	0	84
900081		ASMH( 1981 )		0	0	0	85
900082		ASMH( 1982 )		0	0	0	91
900083		ASMH( 1983 )		0	0	0	99
900084		ASMH( 1984 )		0	0	0	63
900085		ASMH( 1985 )		0	0	0	87
900086		ASMH( 1986 )		0	0	0	67
900087		ASMH( 1987 )		0	0	0	78
900088		ASMH( 1988 )		0	0	0	78



TABLE D-4. SAH AND ASMH SALES -- FY-1990  
(Continued)

900089	ASMH( 1989 )	0	25	25	101
900090	ASMH( 1990 )	0	33	33	33
901085	ASMH( 1ST VOLUME-1985 HANDBOOK )	0	0	0	1
901088	ASMH( 1ST VOLUME-1988 HANDBOOK )	0	0	0	1
901089	ASMH( 1ST VOLUME-1989 HANDBOOK )	0	0	0	1
901090	ASMH( 1ST VOLUME-1990 HANDBOOK )	0	2	2	2
902084	ASMH( 2ND VOLUME-1984 HANDBOOK )	0	0	0	1
902085	ASMH( 2ND VOLUME-1985 HANDBOOK )	0	0	0	1
902088	ASMH( 2ND VOLUME-1988 HANDBOOK )	0	0	0	1
902089	ASMH( 2ND VOLUME-1989 HANDBOOK )	0	0	0	1
902090	ASMH( 2ND VOLUME-1990 HANDBOOK )	0	2	2	2
903088	ASMH( 3RD VOLUME-1988 HANDBOOK )	0	0	0	1
903089	ASMH( 3RD VOLUME-1989 HANDBOOK )	0	0	0	1
903090	ASMH( 3RD VOLUME-1990 HANDBOOK )	0	2	2	2
904088	ASMH( 4TH VOLUME-1988 HANDBOOK )	0	0	0	1
904089	ASMH( 4TH VOLUME-1989 HANDBOOK )	0	0	0	1
904090	ASMH( 4TH VOLUME-1990 HANDBOOK )	0	2	2	2
905084	ASMH( 5TH VOLUME-1984 HANDBOOK )	0	0	0	1
905088	ASMH( 5TH VOLUME-1988 HANDBOOK )	0	0	0	1
905089	ASMH( 5TH VOLUME-1989 HANDBOOK )	0	0	0	1
905090	ASMH( 5TH VOLUME-1990 HANDBOOK )	0	2	2	2
910078	ASMH( 1978 SUPPLEMENT )	0	0	0	1
910079	ASMH( 1979 SUPPLEMENT )	0	0	0	679
910080	ASMH( 1980 SUPPLEMENT )	0	0	0	1, 183
910081	ASMH( 1981 SUPPLEMENT )	0	0	0	592
910082	ASMH( 1982 SUPPLEMENT )	0	0	0	532
910083	ASMH( 1983 SUPPLEMENT )	0	0	0	736
910084	ASMH( 1984 SUPPLEMENT )	0	0	0	897
910085	ASMH( 1985 SUPPLEMENT )	0	0	0	740
910086	ASMH( 1986 SUPPLEMENT )	0	2	2	726
910087	ASMH( 1987 SUPPLEMENT )	0	2	2	700
910088	ASMH( 1988 SUPPLEMENT )	0	71	71	695
910089	ASMH( 1989 SUPPLEMENT )	0	40	40	644
910090	ASMH( 1990 SUPPLEMENT )	0	522	522	529
910163	ASMH( 1ST SUPPLEMENT 1963 )	0	1	1	1
910169	ASMH( 1ST SUPPLEMENT 1969 )	0	1	1	1
910171	ASMH( 1ST SUPPLEMENT 1971 )	0	1	1	1
910180	ASMH( 1ST SUPPLEMENT 1980 )	0	1	1	1
910182	ASMH( 1ST SUPPLEMENT 1982 )	0	1	1	1
910188	ASMH( 1ST SUPPLEMENT 1988 )	0	1	1	1
910189	ASMH( 1ST SUPPLEMENT 1989 )	0	1	1	1
910269	ASMH( 2ND SUPPLEMENT 1969 )	0	1	1	1
910270	ASMH( 2ND SUPPLEMENT 1970 )	0	1	1	1
910278	ASMH( 2ND SUPPLEMENT 1972 )	0	0	0	1
910280	ASMH( 2ND SUPPLEMENT 1980 )	0	0	0	1
910281	ASMH( 2ND SUPPLEMENT 1981 )	0	1	1	1
910282	ASMH( 2ND SUPPLEMENT 1982 )	0	1	1	1
910287	ASMH( 2ND SUPPLEMENT 1987 )	0	1	1	1
910288	ASMH( 2ND SUPPLEMENT 1988 )	0	1	1	1
910289	ASMH( 2ND SUPPLEMENT 1989 )	0	1	1	1
910381	ASMH( 3RD SUPPLEMENT 1981 )	0	1	1	1
910385	ASMH( 3RD SUPPLEMENT 1985 )	0	1	1	1
910388	ASMH( 3RD SUPPLEMENT 1988 )	0	2	2	2
910389	ASMH( 3RD SUPPLEMENT 1989 )	0	1	1	1
910480	ASMH( 4TH SUPPLEMENT 1980 )	0	1	1	1
910481	ASMH( 4TH SUPPLEMENT 1981 )	0	1	1	2
910482	ASMH( 4TH SUPPLEMENT 1982 )	0	1	1	1
910487	ASMH( 4TH SUPPLEMENT 1987 )	0	1	1	1
SPLIT	JAN90 SPLIT OF 910090 FOR ACCOUNTING	0	522	522	529
T O T A L		0	1,436	1,436	14,840

APPENDIX E  
FISCAL REPORTS FOR JULY AND AUGUST 1990

TABLE E-1. JULY FISCAL REPORT

Contract DLA980-83-C-1744		Current Period: 29 Jun 90 to 26 Jul 90				Cumulative Period: 15 Jun 83 to 26 Jul 90			
Program Element		Income		Expenditures		Cumulative	Balance		
		Current	Cumulative	Current	Cumulative				
Baseline		\$5,710.38	\$6,291,387.10	\$52,975.24	\$6,222,086.59		\$69,300.51		
Direct Funds		\$0.00	\$4,585,964.43						
Government Block Funds		\$0.00	\$0.00						
Subscriptions/Sales		\$5,710.38	\$1,705,422.67						
Special Tasks		(1) \$69,588.28	(2) \$9,638,632.78	\$69,420.96	\$9,151,879.94		\$488,752.84		
Total Program		\$75,298.66	\$15,930,019.88	\$122,396.20	\$15,373,986.53		\$556,053.35		

(1) MIPR \$69,588.28 [Mod P00194, \$72,885; Mod P00199, (\$3,296.72)]

Subscriptions and Conference Registration Fees \$0.00

(2) MIPR \$9,394,782.06  
Subscriptions and Conference Registration Fees \$243,856.72

TABLE E-2. AUGUST FISCAL REPORT

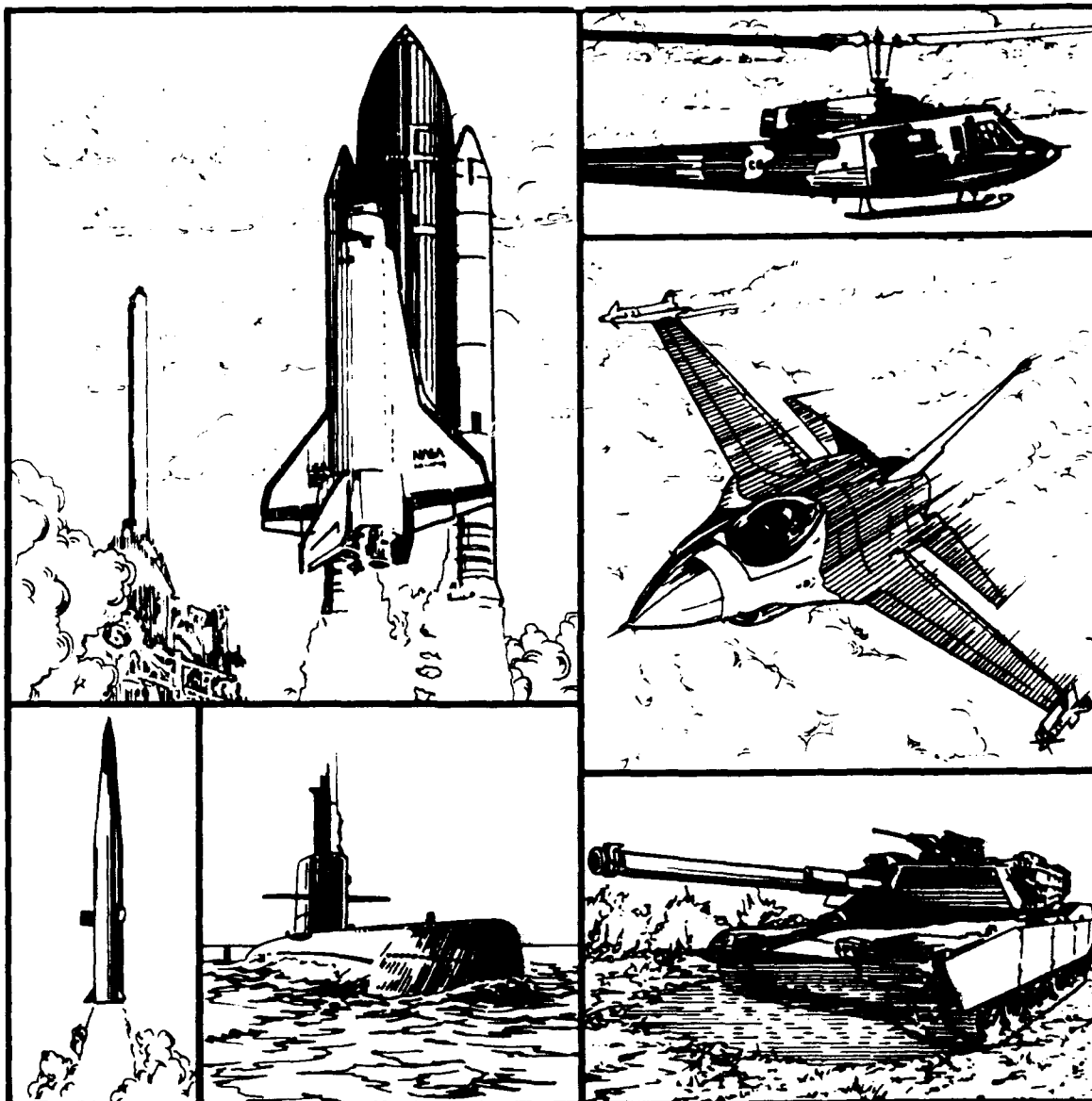
Contract DL900-83-C-1744		Current Period: 27 Jul 90 to 30 Aug 90				Cumulative Period: 15 Jun 83 to 30 Aug 90			
Program Element		Income		Expenditures		Cumulative Balance			
		Current	Cumulative	Current	Cumulative				
Baseline		\$4,607.61	\$6,295,994.71	\$81,816.13	\$6,303,341.00	(\$7,346.29)			
Direct Funds		\$0.00	\$4,585,964.43						
Government Block Funds		\$0.00	\$0.00						
Subscriptions/Sales		\$4,607.61	\$1,710,030.28						
Special Tasks		(1) \$0.00	(2) \$9,638,633.19	\$147,124.31	\$9,299,565.97	\$339,067.22			
Total Program		\$4,607.61	\$15,934,627.90	\$228,940.44	\$15,602,906.97	\$331,720.93			

(1) MIPR \$0.00  
Subscriptions and Conference Registration Fees \$0.00

(2) MIPR \$9,394,782.47  
Subscriptions and Conference Registration Fees \$243,850.72

# METALS AND CERAMICS INFORMATION CENTER

## User's Guide and Materials Information Publications List



**A DoD Information Analysis Center  
at  
Battelle**

### **PRODUCTS AND SERVICES**

- Technical Inquiries and Special Studies
- Current Awareness
  - State-of-the-Art Reports
  - Handbooks
  - Bibliographies
  - Access to Materials Information Database

## **THE HISTORY OF THE METALS AND CERAMICS INFORMATION CENTER**

The Metals and Ceramics Information Center and its predecessors have been in continuous operation at Battelle since 1955. At that time the Titanium Metallurgy Laboratory was established at Battelle for the Department of Defense (DoD) to gather the results of current titanium research into one analysis center. Three years later, that program was expanded in scope to include other metals used in critical DoD applications. This was reflected in its new name—the Defense Metals Information Center (DMIC).

Based on the DMIC example, the Ceramics and Graphite Technical Evaluation Center was established at Wright-Patterson Air Force Base in the early 1960s. After being chartered as a DoD Information Analysis Center their program was assigned to Battelle in 1967 for operation as the Defense Ceramics Information Center (DCIC).

In 1971, DMIC and DCIC were merged to form the Metals and Ceramics Information Center. This new Center—MCIC—now covered both metals and ceramics of interest to DoD and its related industrial and academic communities.

The technical management of the Center is assigned to the Office of the Under Secretary of Defense, Research and Advanced Technology; contract administration is performed by the Defense Logistics Agency.

With a bibliographic database of over 135,000 documents and the resources available at Battelle, MCIC now provides in-depth responses to technical inquiries, and also, the products and services described herein as required of a full-service Information Analysis Center.

### **INFORMATION ANALYSIS CENTERS (IAC)**

MCIC is part of a group of IACs operated through the Defense Technical Information Center. For further information, contact MCIC or

Defense Technical Information Center  
Defense Logistics Agency  
Cameron Station  
Alexandria, Virginia 22304-6145  
Telephone (202) 274-6260

### **ABOUT THE COVER**

The art on the cover montage illustrates some of the systems that are impacted by materials included in the scope of the Metals and Ceramics Information Center.

# METALS AND CERAMICS INFORMATION CENTER (MCIC)

## (A Department of Defense Full-Service Information Analysis Center)

### PURPOSE AND OPERATION

MCIC's objective is to collect, evaluate, and disseminate timely information on the characteristics and utilization of advanced metals and ceramics. Available to all sectors of government and industry, the Center's principal services include:

- Technical advice and assistance
- Summaries of important developments in metals and ceramics technology
- State-of-the-art reports and handbooks
- Special studies tailored to a specific area of materials technology
- Access to over 135,000 analyzed and indexed references sources.

Located at the Columbus operations of Battelle, MCIC can call upon the knowledge of over 1000 Division scientists and engineers throughout the Battelle staff to provide its users with a timely and authoritative, yet diversified, service. Information collected from a wide variety of sources is evaluated and analyzed by MCIC specialists before addition to the Center's computerized files. Recently, several foreign countries have been very active in materials technology. Therefore, collection of foreign literature within the scope of the Center has been emphasized in the past several years. The Center is the largest single information resource in the free world for most materials within its scope.

### CURRENT AWARENESS SERVICE

The "Current Awareness" function of MCIC serves to alert users, on a timely basis, to significant technological developments. The principal vehicle for this function is the "Current Awareness Bulletin" (CAB), a monthly publication which:

- Summarizes significant developments in technology related to

Light Metals	Selected Glasses and	Properties
High-Strength Steels	Glass Ceramics	(physical/mechanical)
Superalloys	Coatings	Environmental Effects
Refractory Metals	Processing	Test Methods
Ceramics	Fabrication	

- Presents pertinent information on timely technical meetings, R&D contract awards, and new technical literature.
- Summarizes and highlights technical topics and/or meetings of interest.
- Announces new MCIC publications and summarizes MCIC activities.

The CAB is available, without charge, to qualified subscribers located in the United States. Written requests for the CAB should be submitted directly to MCIC at Battelle.

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Utilizing the information and technical resources of MCIC and the Battelle technical staff, special studies are undertaken for government agencies to provide timely responses to the unique needs of MCIC users. Costs for those services are handled as special task orders through the basic MCIC contract or on separate contracts. Among the special studies undertaken are:

- In-depth review and analysis of technical literature in highly specified areas
- Development of data for specialized applications or materials
- Comparisons of foreign and domestic technologies
- Technical assistance in materials applications
- Review of materials standards/specifications
- Development of computer-based information systems and databanks
- Technical conference/symposia organization, administration, and publication of proceedings.

## HOW TO USE THE METALS AND CERAMICS INFORMATION CENTER

### TECHNICAL INQUIRIES AND SPECIAL STUDIES

Inquiries, requests for literature searches, and special technical requirements should be addressed to MCIC, by letter, wire, or most simply, by telephone. A qualified specialist is assigned to each inquiry to provide personal, immediate response by phone or correspondence. All inquiries and requests for technical assistance are handled in confidence. Fees are quoted in advance and are based on incurred costs only. Payment may be made via a purchase order, through a technical assistance agreement with Battelle, or in special cases, by separate contract. Inquiries from Department of Defense Agencies can be handled by the use of a Military Interdepartmental Purchase Request (MIPR) through the basic MCIC contract. Please contact MCIC for further information.

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Commander, Defense Logistics Service Center  
 ATTN: DLSC-FBA  
 Federal Center  
 Battle Creek, Michigan 49017-3084

The forms are available from DLSC or MCIC. Questions concerning application approval should be directed to DLSC (1-800-352-3572).

Prices listed are for publications shipped to U.S., Canada, and Mexico, and include 4th class book rate mailing. Unless otherwise noted, prices for publications shipped to overseas addresses are twice the price shown and include shipment by Air Parcel Post only. Any other form of transmittal will require an additional charge.

A charge of \$35 for conversion of currency should be added to payments made in currency other than U.S. dollars.

Prices effective July 1, 1985.

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Battelle  
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 Columbus, Ohio 43201-2693  
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 (614) 424-6379—technical inquiry service  
 (614) 424-6384—publications

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MCIC-73-19	<b>Proceedings of the 1972 Tri-Service Conference on Corrosion</b> , 396 pages, 304 figures, 40 tables (December 1973) AD-771-345.	\$ 40.00
MCIC-74-23	<b>Corrosion of Metals in the Atmosphere</b> , 77 pages, 126 references, 41 figures, 55 tables, index (August 1974) AD-784-943.	\$ 25 00
MCIC-75-27	<b>Proceedings of the 1974 Gas Turbine Materials in the Marine Environment Conference</b> , 589 pages, numerous references, figures, and tables (July 1975) AD-A013 436.	\$ 50.00

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	(Overseas—\$ 67.50)	
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